

REMARKS

In view of the following remarks, the Examiner is respectfully requested to withdraw the rejections and allow Claims 21-45 and 48, the only claims pending and currently under examination in this application.

Claims 21-45 and 48 have been examined and rejected.

Claims 1-20 have been previously cancelled.

Claims 46-47 have been previously withdrawn.

Accordingly, no new matter has been added. As no new matter has been added by way of these amendments, entry thereof by the Examiner is respectfully requested.

Specification

The specification has been objected to for use of a trademark. The specification has been amended to provide the asserted trademark in all capital letters and to include generic terminology. Accordingly, this objection may be withdrawn.

Claim Rejections - 35 U.S.C. § 112

Claims 21-45 and 48 have been rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

In making the rejection, the Examiner states that the claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The Examiner maintains that the cited portions of the specification do not appear to mention sensors that view droplet patterns previously dispensed from a dispensing head, and that the rest of the specification does not disclose sensors that view droplet patterns previously dispensed from a dispensing head, and that the amendments are New Matter (Office Action, p. 3-4).

The Applicants' respectfully disagree. The cited portion of the specification discloses an addressable array with an arrangement of features, wherein the features or spots are formed from a droplet or droplets dispensed from a pulse jet, and it additionally discloses viewing by a camera, thereby supporting the claim element of viewing a droplet pattern dispensed from a head. In addition, as original claims constitute their own description (*In re Koller*, 613 F.2d 819, 204 USPQ 702 (CCPA 1980)), the Applicants point out that the element of viewing "a droplet pattern previously dispensed from said head" can also be found in original claims 10 and 24, presented below for convenience:

10. A method according to claim 1 wherein: the deposition apparatus includes a dispensing head with multiple nozzles to dispense fluid droplets containing the probes or probe precursors, and a transport system to move at least one of the dispensing head and substrate relative to the other as the droplets are dispensed from the head, so as to form the array; the drive pattern controls operation of the transport system; the operating parameter is the position of the substrate or dispensing head, or orientation of a nozzle, and is examined by viewing the substrate, dispensing head, or nozzle, or a droplet pattern previously dispensed from the head.

24. An apparatus according to claim 21 additionally comprising: a dispensing head with multiple nozzles to dispense fluid droplets containing the probes or probe precursors, and a transport system to move at least one of the dispensing head and substrate relative to the other as the droplets are dispensed from the head, so as to form the array; and wherein: the drive pattern controls operation of the transport system; the operating parameter is the position of the substrate or dispensing head, or orientation of a nozzle; and the sensor views the substrate, dispensing head, or nozzle, or a droplet pattern previously dispensed from the head.

In view of the above remarks, the Applicants' respectfully request that the rejections to Claim 21-45 and 48 under 35 U.S.C. § 112, first paragraph be withdrawn.

Claim Rejections - 35 U.S.C. § 102(b)

Claims 21-45 and 48 have been rejected under 35 U.S.C. § 102 (a) as being anticipated by Blanchard (WO 98/41531).

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

The standard for anticipation under section 102 is one of strict identity. An anticipation rejection requires a showing that each limitation of a claim be found in a single reference, *Atlas Powder Co. v. E.I. DuPont de Nemours & Co.*, 224 U.S.P.Q. 409, 411 (Fed. Cir. 1984). Further, an anticipatory reference must be enabling, see *Akzo N.V. v. United States Int'l Trade Comm'n* 808 F.2d 1471, 1479, 1 U.S.P.Q.2d 1241, 1245 (Fed. Cir. 1986), cert denied, 482 U.S. 909 (1987), so as to place one of ordinary skill in possession of the claimed invention. To anticipate a claim, a prior art reference must disclose every feature of the claimed invention, either explicitly or inherently. *Glaxo v. Novopharm, Ltd.* 334 U.S. P.Q.2d 1565 (Fed. Cir. 1995).

An element of the rejected claims 21 and 40 and the claims which depend from them is an apparatus for fabricating an addressable array of biopolymer probes, which includes a sensor, which senses at least one operating parameter wherein the sensor views at least one of: a dispensing head; a nozzle; and a droplet pattern previously dispensed from said head; and a corrected drive pattern different from the target drive pattern such that use of the corrected drive pattern results in a reduced discrepancy between the target and actual array patterns. An element of independent claims 37 and 44 is an operating parameter derived by viewing at least one of a dispensing head; a nozzle; and a droplet pattern previously dispensed from said head, and a corrected drive pattern different from the target drive pattern such that use of the corrected drive pattern results in a reduced discrepancy between the target and actual array patterns. Independent Claim 38 has the element of "...a sensor to sense the position of at least one fiducial mark on the dispensing head...".

In making the rejection, the Examiner states that Blanchard teaches an apparatus for fabricating an addressable array, "where the sensor views droplets previously dispensed from a dispensing head (page 78, line 24 – page 79, line 12)." (Office Action, p. 5).

The Applicants' respectfully disagree. The cited portion of Blanchard that discloses a digital image taken by a camera is to identify a registration mark, as disclosed below:

Typically, the registration mark will not be rotated more than one degree or so from its aligned position. A semi- vertical line and a semi-horizontal line can be identified from the array of pixels because one of the two lines in the registration mark will appear to be vertical and the other to be horizontal. The program calculates the equation for the semi-vertical line (step 1703). Similarly, the program calculates the equation for the semi-horizontal line (step 1704). The program then calculates the intersection of the two lines and records the position (step 1705). If the current and previous calculations of the position of the registration mark agree within some tolerance, the program returns the calculated position as the center position of the registration mark (steps 1707-1708). If they don't agree or any of the steps requires to estimate the position fails, the program re-tries at step 1701. (p. 78 line 29-p.line 12)

The method disclosed in Blanchard is to measure two lines, calculate the intersection of the lines (the registration mark), and compare the position with previous positions. There is no disclosure in Blanchard of a "sensor which senses at least one operating parameter for an error from a nominal value....wherein said sensor views at least one of a dispensing head; a nozzle; and a droplet pattern previously dispensed from said head; and a processor which, when an error is detected by the sensor derives, based on the error, a corrected drive pattern..."

There is no disclosure of this element in Blanchard, because the "error" detected in Blanchard is a difference in positions of the registration mark. There is no disclosure of sensing a droplet pattern previously dispensed from the head to derive a correction (corrected drive pattern).

This is in contrast to the Applicants' invention, in which one element of the claims is to derive a corrected drive pattern from viewing a droplet pattern previously dispensed from the head. This is clearly disclosed in both the specification and figures as shown below:

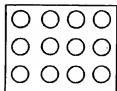


FIG. 6

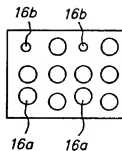


FIG. 7

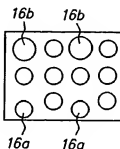


FIG. 8

As disclosed in the specification (p. 15, line 5 – p. 16, line 3), FIG. 6 represents an image in memory of a portion of the target drive pattern, which corresponds to the appearance of the target array pattern with normal operation. However, if the processor determines there is an error in relative orientation of the nozzle of the head which produces spots 16a, or if an error is determined in fluid volumes deposited by the nozzle which produces spots 16b, the processor can then derive a corrected drive pattern. The processor does this by comparing the image in memory (FIG. 6) with the actual droplet pattern (e.g. FIG. 7). A corrected drive pattern can then be derived, which incorporates an inverse of the determined errors. That is, in order to correct for displacement (in the upward direction as viewed in FIG. 7) of spots 16a, the actual drive image will contain an instruction to move the head lower (as viewed in FIG. 8) than the nominal position of FIG. 6 to compensate for the displacement in FIG. 7. Similarly, to correct for the below expected volume (that is, the nominal volume) produced by the jets producing features 16b, the actual drive image will contain an instruction for that jet to fire multiple spots or with more energy (this appearing as enlarged features 16b in FIG. 8) to compensate for the low volume error. While the illustrated errors in FIG. 7 relate to individual spots, other

errors can be general in that they relate to all spots.

Furthermore, the Applicants note that although these elements now constitute non-elected species, the sensor taught by Blanchard is positioned in his apparatus such that it cannot view the dispensing head or a nozzle, as discussed below and in the previous response.

Blanchard's Fig. 5 shows the synthesis system, Fig. 6 shows the inkjet print heads used in the system of Fig. 5, and Fig. 8 shows "an alignment unit" of Fig. 5 (see page 9, lines 11-19). The "print head assembly 24" of Fig. 6 "comprises two print heads 36, mounted within an aluminum block 38" (page 58, line 29). The print heads "are directed upwardly, to deposit liquid on a substrate that is positioned over the print heads" (page 59, lines 9-12). On the other hand the "Alignment unit 26 comprises a marker 50 and a camera [sensor] 52", and the marker "comprises a diamond tip or point that can be raised or lowered in response to activation and deactivation by solenoid 54" to contact and mark an "adjacent substrate" (page 63, lines 6-17). Note that in Fig. 8 the marker 50 and the camera [sensor] 52 face upwardly (in the same direction as the print heads of print head assembly in Fig. 6). This is consistent with the marker being "raised or lowered" into contact with the substrate. Furthermore, after a mark is made on the substrate it can then be "positioned over lens 60" to have its position determined (page 64, lines 6-9).

Thus, from the above, it is apparent that Blanchard's print heads and camera (sensor) both face upwardly and the camera does not (and indeed, cannot) view the print heads or nozzle.

Similarly, there is no disclosure in Blanchard of an operating parameter which is derived from viewing at least one of: a dispensing head, a nozzle, or a droplet pattern previously dispensed from the head as in Claims 37 and 44. There is no disclosure of this element in Blanchard because the "error" detected in Blanchard is a difference in positions of the registration mark. There is no disclosure of sensing a droplet pattern previously dispensed from the head to derive a correction (corrected drive pattern). Furthermore, although the Applicants again note that these elements

represent non-elected species, the sensor taught by Blanchard is positioned in his apparatus such that it cannot view the dispensing head or a nozzle.

Furthermore, there is no disclosure in Blanchard of a sensor to sense the position of at least one fiducial mark on the dispensing head, as in Claim 38. There is no disclosure of this element in Blanchard because there is no disclosure in Blanchard of a dispensing head with a fiducial mark. The dispensing head in Blanchard does not disclose a fiducial mark, because as discussed above, the sensor taught by Blanchard is positioned in his apparatus such that it cannot view the dispensing head.

Accordingly, the Applicants contend that Blanchard is deficient in that it fails to teach every element of the rejected claims, namely, Blanchard does not teach a sensor which senses at least one operating parameter for an error from a nominal value, wherein the sensor views at least one of a dispensing head, a nozzle, and a droplet pattern previously dispensed from said head, and wherein a corrected drive pattern is derived based on the error detected by said sensor. Therefore, the Applicants respectfully request that the 35 U.S.C. § 102(b) rejection of Claims 21-45 and 48 under 35 U.S.C. § 102 (b) over Blanchard (WO 98/41531) be withdrawn.

CONCLUSION

In view of the above amendments and remarks, the Applicants respectfully submit that all of the claims are in condition for allowance, which action is requested. If the Examiner finds that a telephone conference would expedite the prosecution of this application, please telephone Bret Field at (650) 327-3400.

The Commissioner is hereby authorized to charge any underpayment of fees associated with this communication, including any necessary fees for extensions of time, or credit any overpayment to Deposit Account No. 50-1078.

Respectfully submitted,

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